Takasi TUYAMA*: A new species of *Hedyotis* (Rubiaceae) from the Volcano Islands

津山 尚*: 硫黄列島に産するフタバムグラ属の新種

This is to describe a new species, *Hedyotis pachyphylla* from the Volcano Islands, southeast of the Bonin Islands. As well known, the Volcano Islands (or the Sulphur Islands) consist of three islets, that is, from north to south, Kita-iwōtō (Ins. San Alessandro), Naka-iwōtō or Iwō-jima (Sulphur Island), and Minami-iwōtō (Ins. San Augustino), the altitude being 804 m, 167 m, and 918 m respectively. The plant is found sporadically on these islands in dry barren ground on the lower levels. Although these islands are of comparatively new volcanic origin of Pleistocene age, there are some distinct endemic species such as *Elaeocarpus pachycarpus* Koidz. etc.

There are on the Bonin Islands two other species of *Hedyotis* belonging to the endemic section of the genus, sect. Leptopetalum. Only one of them is also generally distributed on the Volcano Islands. This new species, however, has no affinity with these. Allied species should be sought on the other island, especially on the Mariana Islands farther south of the Volcano Islands.

Hedyotis pachyphylla Tuyama, sp. nov. (sect. Diplophragma)

Frutex humilis, caule irregulari flexuoso, ca. ad 35 cm alto, basi ca. 2 cm crasso, cortice tuberculato-verrucoso, ramis annotinis subtetragonis 3-4 mm crassis cinerascentibus, ad nodos transverse prominente elevatis, internodiis brevibus, inferioribus longioribus, 0.3-1.3 cm longis sed vulgo 0.5-0.7 mm longis, in sicco longitudinali rugulosis, ramis hornotinis viridescentibus lucidis tetragonis foliis oppositis confertis praeditis. Folia erecto-patentia anguste oblonga vel anguste ovato-oblonga, apice acuta vel obtuso-acuta et apiculata, basi cuneata vel latiuscule cuneata subsessilia vel brevissime petiolata; lamina 2.0-6.2 cm longa, vulgo ca. 5 cm longa, 0.8-3.7 cm lata, vulgo 2 cm lata, crassa, in sicco nigrescens subtus rugulosa, in vivo supra lucida, infra pallidiora margine integerrima plana, costis supra planis infra leviter elevatis et apicem

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versus planatis, nervis utrinque 3–4 jugis erecto-ascendentibus valde obscuris, stipulis depresso-triangularibus apice breviter acuminatis crassis inter se connatis et tubum brevem formantibus.

Inflorescentia in apice ramuli terminalis brevis, foliis leviter superans, dense trichotome corymbosa ca. 3–5 cm in diametro, pedunculis brevibus 1.0–1.7 cm longis, bracteis inferioribus foliaceis ad 1 cm longis, superioribus minoribus et aquamosis.

Flores erecti albidi in sicco nigri, toto glabri. Calyx ellipsoideus glaberrimus crassus in sicco ca. 5 mm longus 3 mm latus, lobis sepalorum 4, raro 5 erectis anguste oblongo-deltoideis apice subobtusis ca. 1.5 mm longis 1.0 mm latis, pedicellis 1–3 longis glabris. Corolla basi tubulosa 4-vel rarius 5-lobata, lobis lineari-oblongis apice obtuso-acutis ca. 3 mm longis 1.3 mm latis, tubo cylindrico ca. 2.3 mm longo, filamentis staminum in medio tubi corollae adnatis et ad basin corollae decurrentibus ca. 1.5 mm longis filiformibus, antheris ellipsoideis ca. 1 mm longis. Stylus filiformis ca. 4 mm longus tubum leviter superans, stigmate capitato et breviter bilobato. Capsula quadrangulato-ellipsoidea apice manifeste concava, 2-valva septicide dehiscens, in calice persistente valde inclusa. Calyx maturus ad 4–5 mm longus 3.5 mm latus. Semina late ellipsoidea, profunde reticulata, reticulis valde minutissimeque undulatis.

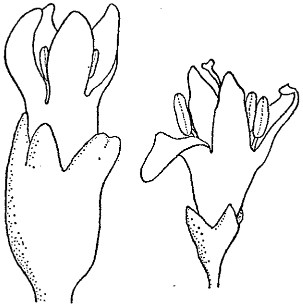

Fig. 1. The flower of *Hedyotis pachyphylla* Tuyama (left) and *H. leptopetaloides* Hatusima (right). Left: Ins. San Alessandro, 22, Oct. 1935, M. Okabe —The left-hand lobe of calyx is casually bilobed at the apex. Right: Ins. Saipan, Kanehira no. 3573, 18, Aug. 1935. All drawn from the boiled flowers from the dried specimens in TI. ×ca 4.

Nom. jap. Atsuba-shimazakura (nov.)

Spec. exam. Volcano Isl.: Ins. Kita-Iwōtō (H. Huzikawa, Aug. 20, 1930—typus fructus in TI) ; ibidem (M. Okabe, Oct. 22, 1935—typus floris in TI) ; Ins. Naka-Iwōtō (T. Nakai, Jun. 22 et 23, 1920) ; ibidem (M. Okabe, Jun. 1938) ; ibidem (T. Tuyama, Jun. 18, 1940) ; ibidem, Motoyama (A. Yamamoto—later A. Takamiya, Aug. 21, 1930) ; Ins. Minami-Iwōtō (leg. M. Okabe, Oct. 22, 1935).

Endemic.

Characteristic to this new species is in that the mature strongly indurated capsule is sunk below the lowest margin of the persistent lobe of the calyx. In addition, the top of the capsule is markedly concave leaving a collar-like structure on the margin. So that the loculicidal opening on the concave surface of the capsule is very narrow even at the time of shedding seeds. Dr. T. Yamazaki of the University of Tokyo suggested me to investigate the seed-coat under the microscope. The seed-coat is highly reticulated on the surface leaving deep pores. The net-work structure is minutely and strongly wavy at the surface view. The toxonomic significance in this respect is left for the future monographer.

The following is the comparison of mainly vegetative and floral structure of four species growing in the Mariana Islands with this new species, with especially referring to the shape of the capsule which has not yet been fully described in the related species.

Hedyotis leptopetaloides Hatusima in Trans. Nat. Hist. Soc. Formos. **26**: 222, fig. 2, 1936 (Kanehira no. 3573, Ins. Saipan, Aug. 18, 1935) has a little similar appearance, but the branchlets are slender, with leaves distinctly petiolated. The calyx is much smaller, with more acute sepals. (Fig. 1) The mature capsule is smaller and less indurated than in *H. pachyphylla*. It is similarly placed a little lower than the lowest margin of the calyx, and is truncate or a little concave at the top, but it is again markedly elevated along the dehisced part. *Hedyotis Kanehirae* Hatusima (syn. *Leptopetalum Kanehirae* Hatusima) l. c.: 218, 1936 (Kanehira no. 2184, Ins. Alamagan, Jul. 6, 1933) has more similar vegetative appearance with shortly petioled or subsessil leaves, but according to Prof. S. Hatusima, stamens are inserted at the base of the corolla tube and are shorter, being completely included in it. On observation of Kanehira no. 2184 in TI, the top of the mature capsule is found to be rounded and highly raised above the obscure teeth of the calyx and thin in texture. Mainly based on the place of insertion of the stamens, Dr. S. Hatusima included this species in a new section under *Leptopetalum* (*Hedyotis* sect. Leptopetalum Benth. et Hook. f.). His inclusion seems to me, however, a little too mechanical. *Hedyotis mariannensis* Merrill in Philip. Journ. Sci. Bot. **9**: 144, 1914 (Kanehira no. 1815, Rota, Jul. 10, 1932; Kanehira no. 1733, Rota, Jul. 8, 1932 and Kanehira no. 1030, Saipan, Jul. 1930) is markedly different from the present species, by diffusedly branched and long-

peduncled inflorescence, and long funnel-shaped corolla tube. The mature capsule is much smaller, and is highly elevated beyond the obscurely dentate calyx with widely dehisced valves. In conclusion, *Hedyotis pachyphylla* is independent from any of all these species, and among them it is rather intimately related to *H. leptopetaloides* in shape and texture of the capsule.

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小笠原諸島には *Hedyotis* に属するマルバシマザクラおよびシマザクラの2種の低木を産し，その南西部に位置する硫黄列島にも前者を産する。これらは他にはない特産種で，非常に種類の多い本属中の Leptopetalum という特産の節に分類されている。この節では花筒部が球状で，花冠の裂片は細長く，中央以上は反曲捻転して垂下し，内部は有毛，雄芯も長く飛び出していて，かつ花筒部の基部に附着している。ここに発表した新種アツバシマザクラ *Hedyotis pachyphylla* Tuyama は硫黄列島の3島即ち北・中・南の各硫黄島にのみ産する小低木で，上記の2種とは全く類縁がない。

本種の花筒は円筒状で花冠の裂片は太く短い。本種に近縁のものは硫黄列島のさらに南に位置するマリアナ列島産の *Hedyotis* の中で Diplophragma 節のものにもとめられ，その中でもサイパン島産の *H. leptopetaloides* Hatusima がやや近いが，種としては明かに異ったものである。本種のよい特長は朔果が萼筒内に完全に包まれていることで，朔果の頂部は凹入している。この凹入の傾向は *H. leptopetaloides* でも弱い程度で認められるが，Fig. 1 に示されるように花の外観の異ることは勿論，明かに葉柄のあること，朔果の小さいこと，その硬化の程度の弱いことでも明確に本種と区別される。

硫黄列島は洪積世に噴出した火山で，現に中硫黄島は活動中であり，地質的には新しい島であるが，他にもこの列島特産の種が数種ある。この点では同様に火山性のマリアナ列島に特産種があることと同様であって，世界的に見ても特殊な状態が起っているわけではない。